

**UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS**

SINGULAR COMPUTING LLC,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

Civil Action No. 1:19-cv-12551-FDS

Hon. F. Dennis Saylor IV

REDACTED VERSION

**STATEMENT OF MATERIAL FACTS IN DISPUTE RE: DEFENDANT’S
MOTION FOR SUMMARY JUDGMENT THAT
THE ASSERTED PATENT CLAIMS ARE PATENT INELIGIBLE**

Plaintiff, Singular Computing LLC (“Singular”), submits: (A) the following response to the statement of material facts submitted by defendant, Google LLC (“Google”), in support of its motion for summary judgment that the asserted patent claims are patent ineligible, and (B) Singular’s statement of material facts in dispute in opposition to the motion:

Statement of Fact	Response
1.	Not disputed.
2.	Not disputed.
3.	Singular disputes that either asserted claims recites “must accept.” Singular does not dispute that the asserted claims both recite at the cited portions “the dynamic range of the possible valid inputs to the first operation is at least as wide as from 1/1,000,000 through 1,000,000.”
4.	Disputed. Claims must be read in view of the specification. <i>Phillips v. AWH Corp.</i> , 415 F.3d 1303, 1315 (Fed. Cir. 2005). Google’s assertion of fact is inconsistent with the structure recited in the specification. <i>See, e.g.</i> , ’273 patent, Figs. 1-6; ’156 patent, Figs. 1-6. Google’s assertion of fact is also inconsistent with the Court’s construction of the claims. <i>See, e.g.</i> , Dkt. No. 354, at pp. 16-26. For example, the Court construed “execution unit” as a “processing element comprising an arithmetic circuit paired with a memory circuit.” <i>See also</i> Response to Material Fact No. 6 below.

Statement of Fact	Response
5.	The term “that requires” is a statement of law not a statement of fact and, therefore, is objected to. Singular does not dispute that the asserted claims recite an “exceeds” limitation as recited therein.
6.	The term “that requires” is a statement of law not a statement of fact and, therefore, is objected to. Singular does not dispute that claim 7 of the ’156 patent recites a “first computing device adapted to control the operation of the at least one first LPHDR execution unit.”
7.	Not disputed.
8.	Disputed. <i>See, e.g.</i> , ’273 patent Figs 1-6 and cols. 7-29; ’156 patent, Figs. 1-6 and cols. 6-29.
9.	Disputed because Google does not define what “It” is intended to refer to. Also disputed to the extent that Google is attempting to make an assertion of fact that is contrary to the cited excerpts. For example neither specification mentions the term “anything” in this context. The specification speaks for itself at col. 29:5-19.
10.	Disputed. For example the X-5%, Y=0.05%, 1/1,000,000 through 1,000,000 are numerical values. Singular does not dispute that the specification states what is quoted from col. 6:10-12 and 23-28.
11.	Singular disputes that the specification “goes out of its way” (whatever that is intended to mean) to assert that “analog and mixed signal embodiments” are “merely examples” and not limitations. Singular does not dispute that the specification states what is quoted from col. 16:14-16.
12.	Singular does not dispute that the Gustafson Report states what is set forth in the cited paragraphs thereof. To the extent Google intends that its characterizations thereof are inconsistent with the Report, they are disputed.
13.	Disputed. Dr. Khatri’s Report dated December 22, 2022 also addresses problems with the prior art and how Dr. Bates’s LPHDR technology improves thereupon. <i>See, e.g.</i> , Khatri Decl., Ex. 1, ¶¶ 62-68.
14.	Singular disputes Google’s characterization “summary opinion.” The Rebuttal Report speaks for itself. Singular does not dispute that the Rebuttal Report includes the quoted phrase.
15.	The Report speaks for itself. Singular does not dispute that the Report includes paragraphs 62-68 and 256-259.
16.	Disputed. <i>See, e.g.</i> , Khatri Report, ¶¶ 65-68; 115, 118. Singular denies Google’s assertion that Dr. Khatri’s Report lacks elaboration or support. <i>See, e.g.</i> Khatri Rebuttal Report, 0223-0272; <i>see also</i> Khatri Report, ¶¶ 0062-0068; 0077-0083; 0248-0258; 0270-0282; 0302-0332. Singular does not deny that paragraph 257 states what is quoted in footnote 3.

Statement of Fact	Response
17.	Disputed. Dr. Khatri does not state that the use of LPHDR execution units is “purportedly” novel over the prior art. Paragraphs 257 and 260-67 of the Khatri Report speak for themselves. To the extent Google intends that its characterizations thereof are inconsistent with the Report, they are disputed. Singular denies Google’s assertion that Dr. Khatri’s Report lacks elaboration or support. <i>See, e.g.</i> , Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272. Singular does not deny that paragraph 257 of the Rebuttal Report states what is quoted in footnote 3.
18.	Disputed. For example, Khatri’s Reports describe how, in the words and documents of Google’s engineers and others, the subject matter of the claims is not directed to subject matter that was conventional, routine or well-understood. <i>See, e.g.</i> , Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.

Set forth below is Singular’s identification of material facts in dispute (“SMF”):

No.	Statement of Fact	Supporting Evidence
SMF 1.	The ’273 patent accurately discloses problems with prior art computing devices.	<i>See, e.g.</i> , ’273 patent, at 1:52-2:7; 3:7-5:62; Khatri Rebuttal Report, at ¶ 256.
SMF 2.	The ’156 patent accurately discloses problems with prior art computing devices.	<i>See, e.g.</i> , ’156 patent, at 1:55-2:11; 3:11-5:67; Khatri Rebuttal Report, at ¶ 256.
SMF 3.	On July 27, 2022, the Court issued a Memorandum and Order on Claim Construction (“CCO”) in this case.	Dkt. No. 354
SMF 4.	The ’273 patent accurately describes problems with the prior art.	<i>See, e.g.</i> , ’273 patent, col. 1:30-col. 2:11.
SMF 5.	The ’156 patent accurately describes problems with the prior art.	<i>See, e.g.</i> , ’273 patent, col. 1:30-col. 2:11.
SMF 6.	The CCO accurately describes some of the problems with the prior art to the ’273 patent and the ’156 patent.	CCO, at pp. 2-3.
SMF 7.	In his Reports, Dr. Khatri accurately describes problems with the prior art.	Khatri Report, at ¶¶ 62-63; Khatri Rebuttal Report, at ¶¶ 256.
SMF 8.	The invention recited in claim 53 of the ’273 patent improves upon the prior art, as described in the	<i>See, e.g.</i> , ’273 patent, Abstract, Figs. 1-6, cols. 2-29; <i>see also</i> Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282;

No.	Statement of Fact	Supporting Evidence
	specification and Dr. Khatri's Reports.	0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 9.	The invention recited in claim 7 of the '156 patent improves upon the prior art, as described in the specification and Dr. Khatri's Reports.	<i>See, e.g.,</i> '156 patent; Abstract, Figs. 1-6, cols. 2-29. <i>see also</i> Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 10.	The accused TPU devices practice the invention recited in claim 53 of the '273 patent.	Supp. Infringement Contentions, Gannon Decl. Ex. X; Khatri Report, ¶¶ 45-47.
SMF 11.	The invention recited in claim 53 of the '273 patent was not conventional at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 12.	The invention recited in claim 53 of the '273 patent was not routine at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 13.	The invention recited in claim 53 of the '273 patent was not well-understood at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 14.	The invention recited in claim 7 of the '156 patent was not conventional at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 15.	The invention recited in claim 7 of the '156 patent was not routine at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.
SMF 16.	The invention recited in claim 7 of the '156 patent was not well-understood at the time of the invention.	Gannon Decl., Exs. C-W; Khatri Report, ¶¶ 0062-0068; 0077-0083; 0111-0146; 0248-0258; 0270-0282; 0302-0332; Khatri Rebuttal Report, ¶¶ 0223-0272.

No.	Statement of Fact	Supporting Evidence
SMF 17.	The accused TPU devices practice the invention recited in claim 7 of the '156 patent.	Supp. Infringement Contentions, Gannon Decl. Ex. Y; Khatri Report, ¶¶ 19-45.
SMF 18.	Dr. Bates disclosed his LPHDR design to engineers at Google prior to 2017.	Gannon Decl. Exs. K-N.
SMF 19.	Google was interested in Dr. Bates's LPHDR chip, <i>inter alia</i> , because it was designed [REDACTED] [REDACTED]	Gannon Decl., Ex. I..
SMF 20.	After reviewing Dr. Bates's slides, [REDACTED] [REDACTED] [REDACTED] [REDACTED]	Gannon Decl., Exs. K, O-P.
SMF 21.	Dr. Teller has a B.S. in Computer Science from Stanford University, an M.S. in Symbolic and Heuristic Computation from Stanford, and a Ph.D. in Computer Science from Carnegie Mellon University.	Gannon Decl., Ex. O, p. 9.
SMF 22.	A Google [REDACTED] [REDACTED] [REDACTED]	Gannon Decl., Ex. P, p. 43:4-5.
SMF 23.	Andrew Ng. described Dr. Bates's LPHDR design as [REDACTED]	Gannon Decl. Ex. I, p. SINGULAR-0018412, Ex. P., p. 41.
SMF 24.	Dr. Ng is described on Wikipedia as "one of the world's most influential computer scientists being named one of Time magazine's 100 Most Influential People in 2012, and Fast Company's Most Creative People in 2012."	Gannon Decl., Ex. Q.
SMF 25.	Dr. Ng has degrees in Computer Science from Carnegie Mellon University (B.S.) ("Graduated at top of class"), the Massachusetts Institute of Technology (M.S.) and the University of California at Berkeley (Ph.D.).	Gannon Decl., Ex. R.
SMF 26.	Prior to Google's introduction of the TPUv2, [REDACTED] [REDACTED] [REDACTED]	Gannon Decl., Ex. E, pp. 76-77; Ex. F, p. 9/24.

No.	Statement of Fact	Supporting Evidence
	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	
SMF 27.	<p>Prior to Google’s introduction of the TPUv2, [REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Gannon Decl., Ex. F, p. 9/24.
SMF 28.	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Gannon Decl., Ex. G, p. GOOG SING-00133475.
SMF 29.	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Gannon Decl., Ex. T.
SMF 30.	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Gannon Decl., Ex. G, p. GOOG-SING-00133471.
SMF 31.	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Ex. W (Google’s Sixth Response to Interrogatory No. 3); Ex. X (Google’s Fifth Response to Interrogatory No. 23).
SMF 32.	Claim 53 of the ‘273 recites inventive concepts.	SMF 1-31 <i>supra</i> .
SMF 33.	Claim 7 of the ’156 patent recites inventive concepts.	SMF 1-31 <i>supra</i> .

Dated: May 19, 2023

Respectfully submitted,

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ATTORNEYS FOR THE PLAINTIFF

CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who have consented to electronic service are being served with a copy of this document via the Court's CM/ECF system.

/s/ Kevin Gannon